Berichte Geol.B.-A., 94 (ISSN 1017-8880) - 18. Jahrestagung ÖPG Linz (12.-13. 10. 2012)

X-ray computed tomography on Larger Benthic Foraminifera: a (in)credible source of information

ANTONINO BRIGUGLIO[1], ERIC WOLFGRING[1], JULIA WÖGER[1], CARLES FERRÁNDEZ CAÑADELL[2], JOHANN HOHENEGGER[1]

[1]Institut für Paläontologie, Universität Wien, Althanstrasse 14, A-1090 Vienna, Austria; E-mail: antonino.briguglio@univie.ac.at, erik.wolfgring@univie.ac.at
[2]Dept. Estratigrafia, Paleontologia i Geociències Marines, Universitat de Barcelona, C/Martí i Franqués, s/n 08028 Barcelona, Spain

The main function of tests in Larger Benthic Foraminifera (LBF) is to provide their endosymbiotic algae with enough light to obtain net photosynthetic rates and to create sufficient accommodation space. To study the relation between these two factors and to understand how the cell reacts to growth and to the environment, the newly developed technique of X-ray micro-Computer-Tomography (microCT) allows measurement of all characters of complex tests without destruction.

Growth studies on 48 specimens of living and fossil species have been performed. The volumes of the lumina have been calculated as well as further 2-dimensional parameters related to volumes as chamber height, chamber width and septal distance. The volumes of chamber lumina represent cell growth in their sequence, thus demonstrating interruptions, increase/decrease or oscillations in growth rates caused by external factors affecting growth during life time (e.g. seasons). Correlations between volumes and the one-dimensional parameters have been calculated to check the form of relationship.

According to our results, some parameters seem to oscillate exactly as the volume (therefore accommodating it), while others seem to oscillate constantly around a given growth function. Concerning the palaeobiology, beside the study of specimens with 'normal' growth, thus not drastically affected by external factors, some interesting morphologies have been investigated. Pluriembryonal apparati as well as secondary equatorial layers have been segmented, extracted and quantified in almost 15 specimens of *Cycloclypeus carpenteri*, 8 twin specimens of nummulitid tests have been also investigated to show where and how the fusion starts and volumetric quantifications of each single spiral in multispiral grown test of some large Eocene nummulitids has also been calculated to show in which way and when (ontogenetically) a new spiral starts.

The combination of all measurements allows interpretation of different biological and environmental dependencies of LBF. Varying growth rates determines environmental abiotic (e.g. seasons, instantaneous events) and biotic influence (e.g. predation), leading to life time estimation for the fossil forms by comparison with their living relatives.